REMARKS

Examiner Su Kim is thanked for the thorough examination and search of the subject Patent Application. Claims 8, 15, 24, 35, 47, and 59 have been amended and claim 38 has been canceled.

All Claims are believed to be in condition for Allowance, and that is so requested.

Claims 15, 24, 47, and 59 have been amended to overcome the claim objections. The Examiner is thanked for the helpful suggestions.

Reconsideration of the rejection under 35 U.S.C. 102 of Claims 8-9, 14, 24, 26-27, 35, 38-39, and 58 as being anticipated by Haukka et al is requested in view of amended Claims 8, 24, and 35 and in accordance with the following remarks.

Claims 8, 24, and 35 claim that the "atomic ratio of Nitrogen and Hafnium of said hafnium nitride layer is adjusted to adjust the work-function of said gate electrodes wherein said atomic ratio of nitrogen to hafnium remains greater than one." Claim 35 has been amended to incorporate canceled claim 38 into claim 35. Claims 8, 24, and 35 have been amended to claim an atomic ratio of "greater than one." Although Haukka et al disclose an atomic ratio of nitrogen to hafnium of 1 (paragraph 0047), the reference does not teach varying the atomic ratio of nitrogen to hafnium. Applicants' invention teaches adjusting the work-function of the gate electrodes by adjusting the atomic ratio.

Reconsideration of the rejection under 35 U.S.C. 102 of Claims 8-9, 14, 24, 26-27, 35, 38-39, and 58 as being anticipated by Haukka et al is requested in view of amended Claims 8, 24, and 35 and in accordance with the remarks above.

Reconsideration of the rejection under 35 U.S.C. 103(a) of Claims 10, 12, 15, 54, 56, and 59 as being unpatentable over Haukka et al in view of Optimum range is requested in view of amended claims 8 and 24 and in accordance with the following remarks.

Claims 8 and 24 have been amended to claim an atomic ratio of "greater than one." Although Haukka et al disclose an atomic ratio of nitrogen to hafnium of 1 (paragraph 0047), the reference does not teach or suggest varying the atomic ratio of nitrogen to hafnium. Applicants' invention teaches adjusting the work-function of the gate electrodes by adjusting the atomic ratio.

Reconsideration of the rejection under 35 U.S.C. 103(a) of Claims 10, 12, 15, 54, 56, and 59 as being unpatentable over Haukka et al in view of Optimum range is requested in view of amended claims 8 and 24 and in accordance with the remarks above.

Reconsideration of the rejection under 35 U.S.C. 103(a) of Claims 11 and 55 as being unpatentable over Haukka et al in view of Kubota et al is requested in view of amended claims 8 and 24 and in accordance with the following remarks.

As discussed above, Claims 8 and 24 have been amended to claim an atomic ratio of "greater than one." Although Haukka et al disclose an atomic ratio of nitrogen to hafnium of 1 (paragraph 0047), the reference does not teach or suggest varying the atomic ratio of nitrogen to hafnium. Applicants' invention teaches adjusting the work-function of the gate electrodes by adjusting the atomic ratio.

Reconsideration of the rejection under 35 U.S.C. 103(a) of Claims 11 and 55 as being unpatentable over Haukka et al in view of Kubota et al is requested in view of amended claims 8 and 24 and in accordance with the remarks above.

Reconsideration of the rejection under 35 U.S.C. 103(a) of Claims 40-43 and 45-46 as being unpatentable over Li in view of Haukka et al is requested in accordance with the following remarks.

Li teaches a diffusion barrier layer 214 that may be a nitride of a refractory metal (col. 5, lines 3-15). Then a graded metal alloy 216 is deposited over the diffusion barrier layer. Furthermore, after the layers 214 and 216, Li deposits a gate metal layer 218, which is metallic copper (see Li's claim 1). The layers 214 and 216 are a copper diffusion barrier layer and a copper seed layer, respectively (col. 4, lines 35-40). Layers 214 and 216 together do not complete the gate electrode. Thus, they are not comparable to the first metal layer and the second metal layer in Claim 40. Claim 40 claims that the first metal layer, the second metal capping layer, and the dielectric layer are patterned to form the gate electrodes.

Reconsideration of the rejection under 35 U.S.C. 103(a) of Claims 40-43 and 45-46 as being unpatentable over Li in view of Haukka et al is requested in accordance with the remarks above.

Reconsideration of the rejection under 35 U.S.C. 103(a) of Claim 47 as being unpatentable over Li view of Haukka et al and further in view of Optimum range is requested in accordance with the following remarks.

As discussed above, layers 214 and 216 of Li together do not complete the gate electrode. A copper layer 218 overlying layer 216 completes the gate electrode. Thus, layers 214 and 216 are not comparable to the first metal layer and the second metal layer in Claim 40.

Reconsideration of the rejection under 35 U.S.C. 103(a) of Claim 47 as being unpatentable over Li view of Haukka et al and further in view of Optimum range is requested in accordance with the remarks above.

Allowance of all Claims is requested.

It is requested that should Examiner Kim not find that the Claims are now Allowable that the Examiner call the undersigned at 845 4525863 to overcome any problems preventing allowance.

Respectfully submitted,

Stephen B. Ackerman, Reg. No. 37,761